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Prof. Heike Kamerlingh Onnes, whose death on February 21 will be widely regretted, was born on September 21, 1853, in Groningen. As a youth he attended a school in that town, of which J. M. Van Bemmelen, who later became professor at Leyden, and whose name will always be remembered in connection with colloid chemistry, was principal.

In 1870 Onnes became a student at the University of Groningen, and from 1871 until 1873 he worked under Bunsen and Kirchhoff at Heidelberg. He remained in Groningen until 1878. His doctoral dissertation was entitled "New Considerations on the Axial Changes of the Earth," and was marked by the combination of theory and accurate experiment which is characteristic of all his later works. In 1881 he became influenced by the theories of Van der Waals and wrote an important paper in which he deduced the law of corresponding states from considerations of statistical mechanics.

In the following year Onnes became professor at Leyden. In his inaugural address he insisted that the laws of physics could be determined by accurate experiment alone. His motto "From measurement to knowledge" was then stated for the first time, and his remarks upon the necessity of the then recently designed pumps of Cailletet and Pictet for the attainment of low temperatures were almost prophetic. It was about this time that Onnes planned his cryogenic program, which has since made his name famous throughout the world. In 1894 he published his first paper on the design and equipment of the Leyden laboratories, and in his inaugural address in 1894 he laid down the importance of accurate measurements at very low temperatures.

The formation of the cryogenic laboratory at Leyden was only made possible by the extraordinary energy and tenacity, combined with organizing talents of a very high degree, which Onnes brought to bear on this subject. As a preliminary it was necessary for him to train mechanics and glass blowers, and as a result of many years of patient work he obtained an organization which is still unique. In 1904 Onnes was able to control large supplies of liquid air. By

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1906 he had developed the technique of the liquefaction of hydrogen on a large scale. In 1908 he attained the triumph of his career by liquefying helium. This feat, taking into consideration the limited supplies of helium and the difficulty in obtaining it in those days, was little short of superhuman.

The amount of careful organization and planning necessary before the experiments were started can only be appreciated by those who have seen the laboratory in action. It is worthy of record that the whole staff was so tired out by their exertions that they could not see the helium even after it was liquefied. The presence of the liquid was pointed out to them by Prof. F. A. H. Schreinemakers, who was in the laboratory at the time.

The boiling point of helium enabled Onnes to reach a temperature only 4.22° above absolute zero. By reducing the pressure he was finally enabled to arrive at a temperature of 0.9° absolute. The writer had the privilege of seeing Onnes attempt to solidify helium. A battery of 15 large Langmuir pumps were put into connection with a supply of liquid helium whereby the pressure was reduced to about 0.2 mm.; in spite of this, however, the helium did not solidify.

The ability to control really low temperatures enabled Onnes to make the astonishing discovery of supraconductivity. It had always been assumed that the resistance of a metal would run out to nil at the absolute zero. Onnes discovered that quite a number of substances showed a sharp discontinuity in their resistance curves at a temperature of about 4° or 5° absolute. Typical examples are lead and cadmium. He passed a current of 1,000 am./sq. mm. through a conductor under these conditions without being able to detect the slightest change of E. M. F.

Onnes's work is well summarized in the volume presented to him on the occasion of the fortieth anniversary of his holding the chair at the University of Leyden. Most of his work was published in the Proceedings of the Physical Laboratory of Leyden, and it is due to the comparative inaccessibility of this publication that Onnes's work is not so widely known as it should be.

It is impossible, within the limits of a brief notice, to give more than an idea of the scope and range of his activities. The division of the above-mentioned work into thermodynamic, magnetic, optical, magneto-optical, radioactive and electric subsections, in each of which he published numerous papers, is an indication of the magnitude of his work.

In later life Onnes received the fullest recognition of his great talents. His own country awarded him a Commandership in the Order of the Lion of the Netherlands. Similar decorations were conferred upon him by the Governments of Poland and Norway. In 1913 he received a Nobel prize for physics. He was an honorary

member of practically every learned society in the world. Onnes was awarded the Rumford medal of the Royal Society in 1912 and was elected a foreign member of the society in 1916.

Turning to his personal side, it is impossible to speak of him without emotion. Onnes was one of the most genial, kind-hearted, and accessible men who ever lived. He made unremitting efforts toward the feeding of children in the destitute areas of Europe in the years immediately following the war. To young men, he was an inspiration. The writer will always remember, with gratitude, his extraordinary kindness and hospitality. He practically kept "open house."

Onnes' scientific memory is imperishable, and his personality will never be forgotten by any one who had the privilege of knowing him.

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